

First Order Differential Equations

Objectives

- Student should be able to identify the type of differential equation and distinguish between separable equations, Euler Homogeneous equations, and linear equations.
- Students should be able to find solutions to the above types of equations.

Recitation Worksheet Problems: Sections 1.4, 1.5

1. Solve the initial value problem

$$ty' - 3y = 2t^4e^{2t}, \quad y(1) = 0.$$

2. Solve the initial value problem

$$\frac{dx}{dt} = \frac{t^2}{x + t^3x}, \quad x(0) = -2.$$

3. Find all implicit solutions, $\psi(x, y) = c$, with c constant, to the following differential equation.

$$\frac{dy}{dx} = \frac{x + y}{x - y}.$$